Focused MASER Absorptive Contrast Angiography for Non-Invasive Detection of Arterial Plaques

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Introduction

Arterial and cardiac plaque accumulation is the single largest factor in morbidity and mortality, bar none; woefully underfunded in comparison with other diseases in terms of research into both diagnostic technologies and treatments.

Abstract

Patients are often unaware that ultrasound-based cardiac exams are not capable of detecting blockages and cardiologists are frequently guilty of misleading their patients deliberately into believing that these sorts of tests are adequate. Patients experiencing troubling symptoms are often dismissed, told they are perfectly healthy, and ultimately keel over and die needlessly from a treatable condition despite seeking care.

Endoscopic angiograms are expensive, invasive, and funding for these tests is doled out parsimoniously by insurance companies to patients who have never suffered a heartattack. Often, the first heartattack is the last one, thus, such a policy is maiming and killing countless Americans. A non-invasive, effective, and low-cost means of detecting arterial blockages before they become deadly is called for to save the lives of the hundreds of thousands of patients each year who are disbelieved by physicians when finding themselves in this situation.

In researching more efficient microwave cooking technology, I discovered the fundamental mechanism underpinning the more rapid heating of lipid structures versus water. This rapid heating, I postulated, is actually due to a tendency of electrons in a lipid layer to spend more time in one section of their atomic orbits than others, leaving their nuclei exposed to possible resonance events with microwaves in the partial absence of the electrons which would typically, through Coulomb forces, repel a large percentage of approaching free electrons in the microwave beam. In lipids, these electrons are, at any given moment, less likely to be in the right part of their orbit to accomplish this repulsion.

Considering this, it stands to reason that if focused microwaves were directed to pass through a patient's torso and coronary artery, if that artery features substantial plaque, given that such plaques are made from lipids, those lipids would absorb a portion of the microwave energy and prevent it from reaching a sensor on the other side of the patient, much as bones block a portion of X-Rays before they can strike a detector plate, providing an outline of dense objects.

Although the density of arterial plaques is so close to the density of water that

ultrasonic and non-contrast X-Rays are not suitable for accurate angiography, lipids have a unique absorptive profile with respect to microwaves.

A low-intensity microwave laser may be directed through the torso of a patient so as to nearly intersect the artery one wishes to check for a blockage to form a baseline that takes the total tendency of a comparable cross-section of the patient's body to block microwaves into account.

That same beam can then be nudged slightly to one side so that it passes through, for example, the coronary artery. If a sensor on the other side of the patient's torso detects a measurable drop in beam strength, this would be sufficient to diagnose a blockage of indeterminate percentage.

Just as a virtual colonoscopy must be followed up by a real one, this type of angiography would at least be sufficient to establish that a problem exists and convince a patient's doctor and insurance company that further testing is justified. It would be as quick as an X-Ray and would not expose the patient to any ionizing radiation.

More detailed angiographic maps may even be constructed by utilizing rotating multi-MASER housings that measure the tendency of MASER beams directed through a multitude of paths to be blocked using many pulses and data samples with the outputs being useful for detecting the location of any lipids within the chest cavity.

It should be emphasized, however, that all of the financial incentives currently governing the American health care system have resulted in policies that cause insurers to have better financial outcomes when patients who should be receiving regular follow-up care are never diagnosed properly in the first place. Insurance companies actually save money when a patient dies abruptly, as opposed to a long and drawn-out decline. With arterial aging, early interventions, although associated with some cost, extend life dramatically.

Conclusion

Extending life expectancy in that health care system would hypothetically mean a greater chance of a patient growing old enough to suffer from some of the more expensive-to-manage conditions that await those who make it into their old age. That means that insurance companies will actively fight to resist the development of tools such as this one, which are little more complicated than the blood oxygen saturation monitors that operate on essentially the same principle. The only difference with MASER Lipid Absorptiometry Angiography (MLAA) being that where those saturation monitors work by measuring the extent to which which oxygen-laden hemoglobin absorbs a portion of emitted IR light relative to finger diameter, this technology measures the way in which lipids within arteries absorb microwave energy after accounting for visceral fat and patient size.